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ABSTRACT

The trend to fewer and larger farm units means fewer individuals will actually have the opportunity to engage in farming, yet increasing numbers of farm students are interested in farm and agriculture-related careers. Five background and experiential factors thought to be predictors of the initial expectation to farm were tested via mail surveys of male agriculture students at 1862 and 1890 southern land grant colleges. A 15% sample (N=1,788) was drawn from the 1862 institutions and a complete enumeration was attempted at the 1890 schools (N=787). As expected, father a farmer, self-defined potential to inherit a farm, high school agricultural coursework, participation in agriculture clubs, and race were all significant predictors. In both the 1890 and 1862 samples, the father as farmer and agriculture course and club participation were linked with greater likelihood of the expectation to farm. This likelihood was even stronger when the inheritance factor was also present. However, nonwhite students (usually at 1890 colleges) were less likely to expect a farm career despite a higher proportion of farm backgrounds. Apparently the usual agents of socialization for farmers (i.e., hardship, uncertainty, etc.) operate to shift black agriculture students to non-farm agriculture careers. The study differs from previous research in its attempt to explore conjoint influences among a limited set of significant experiential and background factors previously viewed individually. (SB)

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THE EXPECTATION TO FARM: AN INTERACTION OF BACKGROUND AND EXPERIENCE*

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ABSTRACT

American agriculture has undergone a downward shift in the number of farms and farmers and an increase in the size of individual farm units. Trends in agricultural education, however, show greater numbers of farm students interested in farming and agriculture-related careers. Given that fewer individuals will have the opportunity to actually engage in farming, important questions relate to the set of background and experiential factors that lead to an initial desire or expectation to farm as well as those conditions that deflect individuals away from farm choices. The paper focuses on antecedent factors indicative of anticipatory socialization to farm occupations.

Data were obtained through a mail questionnaire administered to two samples of agriculture students at 1862 and 1890 Land Grant schools in the Southern region.

In each sample, log-linear models are employed to analyze the cross-classified categories of background factors and the expectation to farm. Of special interest is the interaction of various personal characteristics and experiences as they affect realistic expectations for a farming career.

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THE EXPECTATION TO FARM: AN INTERACTION OF BACKGROUND AND EXPERIENCE

The process by which individuals choose, enter, and maintain farming as an occupation has received growing attention in recent years (Coughenour and Kowalski, 1978; Lyson, 1978, 1979). Changes in the structure of agriculture, in terms of declining farm numbers, number of individuals engaged in farming, and increases in farm size and mechanization have significant implications for individuals planning careers in agriculture (Congressional Budget Office, 1978; Corfman, 1979). A primary concern is a sharp increase in the amount of economic resources an individual must invest in a decision to enter production agriculture, reflecting a narrowing occupational structure in an industry composed of fewer and larger farms.

Extensive changes in agriculture structure have occurred in the South (Brannen, 1969:26). Small farms are concentrated in the region, and it is the smaller, economically marginal operations that have been most vulnerable to structural changes affecting their ability to generate income (Horne, 1979). Over 96 percent of the nation's black-owned farms are in the South, and these units are predominantly small operations (Marshall and Thompson, 1976).

Historically, the educational levels of farmers and farm workers has risen at a slightly increasing rate (Lu, 1979:32). Although there is a practical limit to the education farmers can undertake, it is reasonable to assume that their average educational attainment will level off and approach a limit, probably some level of college training.

Although college attendance often has been seen as an alternative to farming and farming as an obstacle to higher education (Haller, 1957, 1958), college is now widely viewed as a requisite for effective management of technology, capital, and labor in production agriculture (Lyson, 1979). No longer

self-sufficient and inward-looking, a farmer is a manager, coordinator, and planner whose work context has increased in both complexity and sophistication (Pavalko, 1971:169). Farmers most likely to effectively participate in a competitive Southern agriculture will have attended the Land-Grant institutions in the region, as they are the principal source of training and preparation for agricultural occupations.

This paper examines the background and experiences of agriculture students who expect to enter farming as an occupation, focusing on two samples of agriculture students at 1862 and 1890 Land-Grant Universities in the Southern region. We identify a set of antecedent characteristics that contribute to an expectation to farm by facilitating the acquisition of agricultural work values, technical skills, and knowledge of occupational entry paths.

The objective of the analysis is to develop a loglinear model in each sampling context that describes the structural relationship among selected background variables and the expectation to farm. The results should provide further understanding of the patterns of occupational socialization affecting college students expecting occupations in agricultural production.

The Expectation to Farm

An expectation to farm reflects an individual's estimation of probable occupational attainment. Occupational expectations are a product of one's more or less accurate assessment of the external limiting environment, along with one's personal abilities and values (Kuvlesky and Bealer, 1966:276). Expectations are more closely related to existing occupational opportunities, the individuals knowledge of entry paths, and the potential availability of resources to pursue them. Thus, an expectation to farm may be supported by personal experience with agricultural lifestyles, socialization to farm work roles, and some potential to actually enter farming.

Five background characteristics are identified as significant factors, shaping, supporting, or predisposing an expectation to farm. These are father a farmer, a self-defined potential to inherit a farm, participation in agriculture clubs, agricultural coursework in high school, and race.

Each characteristic is considered to affect the acquisition of anticipatory socialization to farming. Anticipatory socialization is the process by which individuals imagine or project what it would be like to be a farmer, acquiring strategic knowledge and trial experiences in the work role (Pavalko, 1971:85). Most of this preparation is implicit, unwitting, and informal, proceeding beyond the boundaries of what formal training provides (Merton, 1957:385). As much socialization takes place in organizational settings, some of the characteristics also reflect institutional experiences where skills are acquired and entry paths defined. We expect each of the five factors to be directly related to the expectation to farm. However, we anticipate that statistical models summarizing these data will require interactions among background factors, revealing the interconnected nature of the characteristics and experiences.

Background Factors in Farming

Farm Father. Farming has been traditionally a father-son (daughter) career path (Coughenour and Kowalski, 1978; Strauss, 1964). Better described as a process of acculturation, the values, work patterns, and sensitivities associated with production agriculture are not solely acquired in a classroom. Exposure to and familiarity with an occupation and its surrounding subculture may function as a subtle and indirect influence on occupational choice of which the individual may be quite unaware (Pavalko, 1971:73). Socialization to farming occurs at an early age, as individuals are exposed to parents, relatives, and the farm environment (Strauss, 1956).

Farm parents give their offspring access to experiences and opportunities often not available to nonfarm children. Young persons with farm fathers grow up in a distinctive subculture about which they are knowledgeable and in which they can move with greater ease than persons who have grown up in non-agricultural subcultures (such as law, business, or blue-collar industrial subcultures) (Pavalko, 1973:73). Growing up in the farm milieu provides exposure to role models and readily available information about the farmer's work role that facilitates a great deal of anticipatory socialization. A childhood spent on the farm may not guarantee commitment to a farm occupation, however. Given the exodus from farm occupations in recent years, parental attitudes may not encourage or reinforce the selection of farming as a career (Haller, 1957).

Inherit a Farm. The importance of family background in present-day farm recruitment is bolstered by a shifting set of economic factors that magnify the importance of inheriting farm land (Beale, 1974). Despite loan programs and favorable tax treatments, young farmers must increasingly rely on family relationships to sustain their prospects to farm (Coffman, 1979). Inflated land costs, capitalization requirements, and shifting economies of size all serve to discourage realistic expectations to farm. Closely-held family farm corporations can allow offspring to gradually acquire equity on an extended basis, often on terms only indirectly related to market conditions (Brewster, 1979).

Occupational choice often is a compromise between reward preferences and expectations of access to specific occupations (Sherlock and Cohen, 1966). Individuals with little realistic opportunities to acquire land and equipment necessary for farming may be deflected to other occupations. Thus, the potential to inherit a farm reflects a possible access to the necessary resources

and a chance to begin farming (Smith et al., 1980).

Agriculture Clubs. Expectations for careers in farming often are fostered by prior experiences in an agricultural environment. Clubs such as 4-H and Future Farmers of America (FFA) are organized with the specific goal of imparting positive growth-oriented experiences to rural youth. Participation in these clubs often provides anticipatory socialization for farming. Membership in 4-H or FFA has been described as a first step on the "agricultural ladder" to the status of owner-operator (Bertrand, 1958:174).

Although many individuals may experience personal development through participation, not everyone will view occupational prospects in farming in a positive way. Agriculture clubs may crystallize an expectation to farm and precipitate commitment to an occupational path in agriculture. Personal exposure to farm work roles also may deflect individuals toward nonfarm opportunities and statuses, given the uncertainties of rewards and the sustained effort farming requires.

Agriculture Course. Another experience mediating the expectation to farm is enrollment in a high school agriculture course. Besides providing an introduction to the technical-managerial content of farming, agriculture courses bring potential beginning farmers together in an agriculturally-oriented milieu. For many individuals, classmates serve as a comparative as well as a normative reference group (Shibutani, 1955). Such groups set and enforce standards for behavior and serve as a base against which individuals evaluate themselves and others. Thus, high school agriculture courses provide formal training as well as an informal mechanism for acquiring strategic occupational knowledge about the distribution of occupational opportunities in farming and the means for pursuing them.

Race. Black youth often face more obstacles to a farm career than do members of the white majority. Most black-operated farms are in the South, and the majority are small (Salomon, 1976; Coleman and Hall, 1979). For black youth, the background factors that generally facilitate entry into agricultural occupations may not offer the same level of encouragement as they do for white youth (Brown and Larson, 1979).

For many black youth, agriculture represents previous patterns of subjugation, frustration, and marginal living on poor land (Beale, 1966). Opportunities in non-agricultural sectors of the labor-market often are more readily available, offer greater stability and have greater prestige than old agrarian lifestyles (Ponder, 1971). Thus, black students may be less inclined to pursue an occupation in production agriculture despite characteristic experiences that would otherwise predispose an expectation to farm.

Agricultural Education in the South

For many years, the educational opportunities for all youth interested in farming were very limited. Especially for blacks, poor quality, segregated, schools often hindered the acquisition of basic skills. At the college level, separate sets of institutions, 1890 and 1862 Morril Act colleges, named for the Federal legislation that sponsored their creation, paralleled the separation by color. The generally lower levels of education found among black farmers in the South reflect, in part, generations of differential investment in human capital (Marshal and Thompson, 1976).

Today, 1862 schools are the larger, mostly white institutions in each state. The smaller, predominantly black, agriculture schools comprise the 1890 institutions (Seals, 1977). Enrollments at both sets of colleges are growing, as is federal support to the 1890 schools. Agriculture majors, however,

account for a sizable segment of the enrollment at a majority of the 1890 schools, a much larger proportion of the student population than at the 1862 schools (Howell and Parent, 1978). Agriculture programs at 1862 schools may be better endowed and larger in absolute numbers, but 1890 schools have a greater proportion of their faculty and enrollment committed to agriculture education (Seals, 1977).

The two sets of institutions represent distinctive contexts for agricultural education in the South. The 1890 curriculums place greater emphasis on agricultural education, agribusiness, as well as training in the basics of production agriculture. The 1862 institutions often are viewed as central sources of innovation in agricultural technology and the extensiveness of training in agricultural production available there reflects the higher levels of support they have received over the years (Molnar et al., 1980). Thus, the two systems of Land-Grant schools in the South represent differential contexts for agricultural education and recruitment to farming.

METHOD

Sample

Undergraduate agriculture student enrollment lists for the Spring 1977 term were obtained for all 1862 and 1890 Land-Grant schools in the Southern region. These enrollment lists served as the sampling frame for the study. At 1862 institutions, a 15 percent sample, stratified by school, was drawn. It was determined that a complete enumeration would be attempted at the 1890 institutions. Given the relative small student population at some 1890 schools, this was the only strategy that would provide sufficient cases for within-school analyses and assure the representativeness of the study.

Data were obtained via a mail questionnaire with three follow-up contacts

(Howell and Parent, 1979). The return rate for 1890 students was 55.8 percent and 76.7 percent of the 1862 student sample returned questionnaires. After self-identified graduate students, female respondents, and cases with missing data were deleted, 787 respondents from the 1890 schools, and 1,788 respondents from the 1862 schools were available for analysis.

The analysis focuses on male agricultural students for a number of reasons. First, since only 50 women (6 in 1890 and 43 in the 1862 sample) indicated an expectation to farm, too few cases were available for valid analysis. Second, farming has been a traditionally male occupation and women often have had to overcome or circumvent additional structural barriers that surround farming as an occupational choice for them. Thus, the choice process for women is likely to be somewhat different and more idiosyncratic than that for men (Pearson, 1979:196). Finally, the issue of women in farming is deserving of more intensive analysis that focuses on the role of women as agricultural producers, agricultural partners, farm helpers, and farm homemakers.

Data from each sample are separately analyzed, primarily because of the differential sampling rates employed within each set of schools. As the analysis focuses on cell frequences in multiway tables, pooled results would exaggerate the effect of the complete enumeration attempted in the 1890 schools. Furthermore, the two sets of schools are distinct institutional contexts, particularly with respect to dimensions of student body size, curriculum emphasis, and racial composition. Substantial differences between the institutional systems also would confound the substantive focus of the paper on the expectation to farm.

Variables

The dichotomous classification variable Expect to Farm (E) was derived from responses to the question "What kind of job do you really expect to have

most of your life." Census occupational categories of farmer, farm manager, and foreman were coded as one, all others as zero. For this variable and all others, missing data were excluded from analysis.

Inherit a farm (I) was derived from the question "Do you expect to inherit a farm or ranch someday." The responses "yes, definitely," "some possibility," and "already inherited one" were coded as one, "no definitely won't" as zero.

Farm father (P) was derived from the question "What is your father's current occupation." Census occupational codes for farmer, farm managers, farm laborers, and farm foremen were coded as one, others zero. If disabled, retired, or deceased, respondents were asked to indicate the occupation he had held for most of his life.

Agriculture course (C) was obtained from the question "Did you take any agriculture courses in high school" and was coded one for yes and zero for no.

Agriculture club (H) was derived from responses to the question "When enrolled in high school, did you participate in any of the following activities." Respondents who indicated participation in Future Farmers of America or in 4-H clubs were assigned a score of one, other zero.

White (W) summarizes responses to the question "How do you describe yourself" for which a series of eight response categories were given. The variable contrasts "white or Anglo-American," coded as one with those who indicated other racial identifications, coded zero.

Analysis

This study employs a log-linear statistical model to assess patterns of association in multi-way cross-classifications of background and experiential factors and the expectation to farm. Log-linear analysis attempts to identify the structure of relationships among categorical variables to discover the

essential features of an observed cross-classification (Reynolds, 1977:109). Unlike interval-level statistical procedures, however, the unit of analysis is not individual scores, but rather cell frequencies in a multi-way cross-tabulation.

In applying the technique, we seek to simplify a complex table by identifying a model that incorporates the systematic patterns of associations in the data and excludes the nonsystematic components. The resulting model can be evaluated by reproducing the table, i.e. the predicted frequencies, and their goodness-of-fit to the actual frequencies observed in the data.

The log-linear statistical model predicts cell frequencies in a cross-classification as a function of a grand mean, single variable effects, and interaction effects. An interaction effect accounts for an association or relationship between two or more variables. For example, the model fully accounting for data in a three-way (A,B,C) cross-classification is:

$$\ln (f_{ijk}) = \Theta + \lambda_i^A + \lambda_j^B + \lambda_K^C + \lambda_{ij}^{AB} + \lambda_{jk}^{BC} + \lambda_{ik}^{AC} + \lambda_{ijk}^{ABC}$$

The saturated (all possible terms) model asserts that the natural logarithm of the expected value of the observed frequencies is a function of the logarithm of expected frequences expressed as a grand mean (Θ), main effects, a series of second-order effects, and a third-order effect (Brown, 1977:301).

The objective of the procedure is to identify a model that parisimoniously summarizes the observed data by incorporating significant associations and eliminating relationships of independence. When a log-linear model is fit to multivariate discrete data, the predicted cell estimates provide a smoothed description of the sample data because the most important structural elements are retained and the random sampling fluctuations are damped (Bishop et al., 1975:123). The search for a final model, if successful, provides a clear and concise statement of what is going on in the contingency table (Davis, 1974:222).

The goodness-of-fit of a particular model is evaluated through a likelihood ratio chi-square test[1] of the (observed-predicted) frequency deviations (Fienberg, 1977:36). The final model selection is the outcome of an interactive search procedure. Successive models are fit to the data and summary measures of goodness-of-fit are examined, eliminating terms that do not contribute significant reductions to the likelihood ratio test statistic. Several different models may "fit" the data, but the final model chosen should not only account for the observed frequencies but reflect a meaningful interpretation of the data.

This study examines a multi-way cross-classification of the expectation to farm in two sampling contexts - 1890 and 1862 Land-Grant colleges in the South. The data analysis first identifies a six-way cross-classification within each sample. The observed cell frequencies are the basis for model development. The partial and marginal associations for the various effects are examined for possible inclusion in the final model. In each sample, the final model is summarized in terms of its goodness-of-fit and the contribution each association makes to the analysis. We inspect standardized residuals for patterns of over and under-estimation that reflect the internal fit of the model. Finally, the log-linear parameters are examined and the relative importance and substantive meaning of the associations are evaluated.

RESULTS

Table 1 shows the univariate distribution of each dichotomous variable in the 1890 and 1862 student samples. Nearly twice the proportion of 1862 students actually expected a farm occupation. A higher percentage of 1862 students expected to inherit a farm, although the 1890 students had a higher proportion of farm fathers. More of the 1890 students reported membership

in an agriculture club and enrollment in a high school agriculture course.

- Table 1 here -

The 1890 sample was somewhat more racially heterogeneous, as 14.5 percent were white whereas 94.6 percent of the 1862 sample were white. Overall, the data show more 1862 students expecting to farm, but more 1890 students having characteristics traditionally associated with a farm occupation.

Table 2 shows the multi-way classification of data from agriculture students at 1890 and 1862 institutions in the Southern region. These data are the basis for log-linear analyses that identify patterns of association and independence among background characteristics and the expectation to farm.[3]

- Table 2 here -

Partial and marginal tests of association for all second-order effects and selected third-order effects are shown in Table 3. A test of partial association examines the difference between full and reduced models of the same order, with the reduced model excluding the effect being tested. The marginal test of association determines whether an association between a set of factors in an effect is zero when summed over all other factors. Larger values for both G^2 test statistics suggest associations to be included in the final model. Other simultaneous tests of higher-order interactions (not shown in the table) indicated that fourth and higher-order interactions were not necessary to explain the data.

- Table 3 here -

The table shows consistent associations between the expectation to farm and having a father who was a farmer (EP). Other associations found in both samples were found between: expect to farm and race (EW); expect to farm and agriculture club (EH); and expect to farm and inherit a farm. Having a farm father and inheriting a farm (IP), agriculture course and club membership (CH), and a three-way interaction among farm father, agriculture course, and club

membership (PCH), were effects consistently associated with larger values of the likelihood ratio test statistic.

Certain other factors exhibited various levels of association, but their utility in explaining the cross-classification is evaluated in the process of model building. It should be noted that a core set of associations were found in both agriculture student samples, although several did not appear in one or the other dataset.

- Table 4 here -

Table 4 summarizes separate models fitted to the 1890 and 1862 agriculture student samples.[4] The relatively small G^2 test statistic values show that the expected frequencies generated by the fitted models do not significantly differ from the observed cell frequencies, i.e. the models fit the data. The incremental tests show the relative contribution of each association to the models.

In the 1890 sample, eight associations were retained to explain the observed data. The expectation to farm was associated with having a farm father, with inheriting a farm, with race, and with 4-H or FFA membership. Other associations show relationships between background factors and a three-way interaction among farm father, agriculture course, and club membership.

A relatively more complex model was required to explain the 1862 cross-tabulation. The expectation to farm was associated with inheriting a farm and having taken a high school agriculture course. A three-way interaction was found among the expectation to farm, farm father, and club membership.[5]

The substantive interpretation and direction of the associations are discussed in the context of the actual log-linear parameters. The next table explores the specific nature of the internal fit of the two models to the data.

- Table 5 here -

Table 5 shows the standardized residuals[3] for the models fit to the agriculture student data. The absolute value of the standardized residuals sum to the overall G^2 of the model. Thus, major points of lack of fit can be observed in individual deviations greater than 1, as well as in the overall pattern of over- and under-estimation (Fienberg, 1977).

The fitted models tended to over-estimate the number of nonwhite individuals who expected to farm, as the greatest imbalance in residuals were found in these columns. The large single residual (+3) occurred here, as fewer 1862 nonwhite students with farm fathers expected to farm. Somewhat fewer 1890 white students did not expect to farm, than predicted by the model. Over the remaining columns, residuals tended to be balanced, with somewhat larger values found in the 1862 data. Row patterns also tended to be balanced, with some minor, but consistent, over-estimation found among those with club membership, agriculture course, no farm father, but will inherit a farm.

- Table 6 here -

The log-linear parameters (lambda) for the final model developed for each sample are shown in Table 6. Lambda is a descriptive statistic that conveys the magnitude and direction of relationship in an effect. The relationship of lambda to its standard error gives some indication of the relative significance of each association (Goodman, 1972:36). The sign of the coefficient shows the direction of the relationship when both factors share the same value.

The main effects are of less interest here because main effects are marginal to the interaction effects, that is, interaction effects include contrasts for the main effects (Fienberg, 1977:39). A single-variable or main effect is a difference in cell frequencies that simply reflects the marginal distributions for one or more items. For example, the lambda for the single effect W is quite large in both samples because race is unevenly distributed in both samples (Davis, 1974:198).

Although they represent somewhat different specifications and are not strictly comparable, the two models in Table 6 show lambda coefficients similar in direction and magnitude, with a few notable exceptions. The EI lambda was positive in both samples, but not twice its standard error in the 1862 data. Inheriting a farm was more consistently associated with an expectation to farm in the 1890 sample (λ=.21). Having a farm father led to an expectation to farm in both samples, but the 1862 coefficient (λ=.47) was nearly twice that found in the 1890 data (λ=.26).

A sign reversal was found between the two samples in the relationship between the expectation to farm and club membership (EH). The coefficient was positive in the 1862 sample (λ=.19) and negative in the 1890 sample (λ=-.19). Four-H or FFA membership did not seem to fulfill the same anticipatory socialization function for 1890 students as it did for the 1862 students.

In an association not included in the 1862 model, the expectation to farm was positively associated with being white (EW) in the 1890 data (λ=.25). Among the 1862 students, taking an agriculture course in high school demonstrated a negative lambda with the expectation to farm (EC), but this relationship is considered to be statistically unreliable because the coefficient was less than twice its standard error.

- Table 7 here -

Although previous tests showed them necessary for model fit, none of the three-way interactions in the 1862 data made large contributions to the task of predicting cell frequencies. The negative lambda PCH in both datasets suggests a deflection from agriculture coursework and 4-H participation among those without farm fathers. Table 7 shows the actual data for three of the substantively more interesting three-way interactions included in the final models. Subtables I and II (PCH) show that students without farm fathers did

not take agriculture courses and/or belong to FFA/4-H than students with farm fathers (PCH). In both samples, an outlying cell reflected large numbers who had none of the three characteristics.

The EPH interaction showed how a farm father reinforced the expectation to farm among 4-H/FFA club members. Again, the largest cell frequency is found for those with none of the characteristics, and is the primary source of the interaction.

Although not detailed in Table 7, the small negative lambda for the IPH interaction reflects large numbers who did not share any of the characteristics in the 1862 sample. The positive CHW interaction is due to larger proportions of white 1862 students who took agriculture courses and were agriculture club members. Individually, the three-way interactions made relatively minor contributions to the 1862 data, but were required for final model fitting.

CONCLUSION

The process by which young people enter farming has long been viewed as a special kind of career path. Little research has explored social origins of those expecting farm careers among students in agricultural curriculums at Land-Grant colleges, where a great deal of selection has already occurred. This study differed from many others in that it endeavored to explore conjoint influences among a limited set of background factors and experiences that individually have been viewed as important conditions in the choice of farming as an occupation.

The ongoing trend toward an agriculture structure of fewer and larger farms is paralleled by a deflection of many young people toward nonfarm jobs. Nonwhite students were particularly less likely to expect a farm career, even

though proportionately more black students possessed the background characteristics traditionally associated with farming. For many nonwhite agricultural students with childhood experiences on small farms and first-hand knowledge of the hardships and uncertainty of farm life, farming is not a desirable choice. The results suggest that the usual agents of socialization to farm operate to shift these youth toward nonfarm careers within the context of production agriculture. The enrollment of these students in a school of agriculture may reflect the transfer of previous experience to occupational choice in agriculture, but a deflection to careers in education, extension, technical services, or other jobs in the agricultural sector.

If participation in clubs such as 4-H or FFA contributed to an achievement orientation and group process values, as a recent evaluation has suggested (Science and Education Administration, 1980), then youth from farms with the least prospects for success in industrialized agriculture may be most affected by this type of experience. The negative association between 4-H/FFA participation and the expectation to farm among 1890 students may be more understandable in these terms.

We argued that the background and experiential characteristics identified for the model represented steps in the process of anticipatory socialization to a farm career. The results show the direct consequences many of these traits have for farm occupation expectations as well as the complex patterns of interrelationship in which these experiences accrue.

Heady (1980) has maintained that the high price of land and the great capital investment required for commercial agriculture will allow only wealthy persons with access to large funds to both own and operate farms. The results of this study suggest that the expectation to have a career in farming is already concentrated among those who stand to inherit a farm or begin farming

under parental sponsorship. Other factors may facilitate the anticipatory socialization of individuals to farming, but under current conditions and trends access clearly will be limited.

The two sets of Land-Grant colleges in the South provide distinctive contexts for the provision of agricultural education. The data showed a common core pattern of relationships across the two sets of schools, but characteristic patterns within each dataset. The study did not address the question of the actually attained farm occupation, as expectations may be tempered by high entry costs and the availability of competing opportunities. Of the select few who will become the next generation of commercial farmers, however, most will possess the background characteristics examined here.

One major advantage of log-linear analysis is that it can be used to identify conditional relationships within a set of data (Rosenberg, 1968). Least-square, linear-model techniques generally do not permit suppressor or distorter variables to be identified in any systematic way.

A major strength of the log-linear approach lies in its potential for comprehensively specifying interrelationships among a limited set of variables, thus more fully allowing real world complexity to be reflected in the statistical model. A major weakness is that the complexity can readily exceed the analysts capacity to assimilate, and thus generalize the results. Although some have argued that log-linear approaches may not simplify analysis when the only model that can explain the cell frequencies is the saturated (all effects) model (Rosenthal, 1980:207), we found a relatively parsimonious set of associations to account for the data.

This study explored linkages among selected background factors and the expectation to farm. It revealed some relationships that represented simple joint associations among background factors, as well as other multiple-variable interactions that contributed to the expectation to farm. Additional

specification of the pattern of associations among qualitative life statuses may contribute to our understanding of the interplay between individual characteristics, family background, and farming.

FOOTNOTES

[1]The likelihood ratio test statistic (G^2) is computed by: $G^2 = 2 \Sigma$ (observed) log $\left(\frac{\text{observed}}{\text{expected}}\right)$.
It is distributed as Pearsonian chi-square (χ^2) with degrees of freedom equal to the number of table cells minus the number of parameters fitted. The statistics χ^2 and G^2 are asymptotically equivalent, that is they are equivalent in very large samples. We interpret "very large" to mean that the total sample size is at least ten times the number of cells in the table (Feinberg, 1977: 36-37). Unlike χ^2, G^2 is additive under partitioning for nested models, allowing tests of differences between full and reduced models.

[2]When the (observed-expected) deviation is divided by the square root of the expected frequency, the deviations is expressed as a component of overall and lack of fit is reflected in above-average (greater than one) values.

[3]Each cell frequency must be nonzero and positive to calculate models estimates. Otherwise, it is impossible to take logarithms. To eliminate cell zeros in this analysis, ½ was added to every observed frequency. This is a commonly used procedure to eliminate sampling zeroes (where the sample size is not large enough to obtain respondents with particular combinations of characteristics) (Reynolds, 1977:160).

[4]Other models that also fit the data (i.e. demonstrated a nonsignificant G^2) were rejected because they contained associations that did not make a significant incremental (full-reduced model) reduction in G^2. Particular attention was given to E associations, because this variable is the substantive focus of the analysis.

[5]Three variable effects arise from differences in cell frequencies which reflect associations between pairs of variables whose strength differs according to the level of a third specifying variable. A three variable effect is analogous to a first order interaction in the analysis of variance (Payne, 1977:111).

Table 1. Distribution of background and experiential characteristics: 1890 and 1862 student samples

Characteristic	Percent "Yes"	
	1890 Students	1862 Students
Expect to farm	8.9	16.8
May inherit a farm	45.9	52.8
Father a farmer	23.6	18.1
Took an agriculture course	55.0	29.4
Member 4-H/FFA	31.4	19.8
White	14.5	94.6
Number	787	1787

Table 2. Multi-way classification of observed frequencies in agriculture student data: 1890 and 1862 samples

4-H or FFA Member	Took agriculture course (C)	Father a farmer (P)	Inherit a farm (I)	Expect to Farm (E)							
				NO				YES			
				White		Nonwhite		White		Nonwhite	
				1890	1862	1890	1862	1890	1862	1890	1862
No	No	No	No	43	572	123	25	1	31	10	4
			Yes	20	344	56	20	4	36	6	3
		No	No	1	4	10	1	1	1	0	2
			Yes	2	31	11	6	5	40	5	2
	Yes	No	No	1	17	29	2	0	2	3	0
			Yes	1	20	24	5	0	1	4	0
		Yes	No	0	1	5	2	0	0	0	0
			Yes	0	8	10	0	0	2	5	1
Yes	No	No	No	2	31	20	0	0	3	0	0
			Yes	2	38	11	2	0	17	0	0
		Yes	No	0	8	5	0	0	3	1	0
			Yes	2	12	11	0	1	24	1	1
	Yes	No	No	7	98	121	6	1	8	3	1
			Yes	8	141	93	4	1	33	7	1
		Yes	No	3	11	35	2	1	8	0	1
			Yes	3	71	58	4	4	75	6	2

1862 sample N = 1788
1890 sample N = 787

Table 3. Partial and marginal tests of association in agriculture student data: 1890 and 1862 schools

Factor	1890 schools		1862 schools	
	Partial G^2	Marginal G^2	Partial G^2	Marginal G^2
E-Expect to farm	585.1	--	836.6	--
I-Inherit a farm	5.2	--	5.5	--
P-Father a farmer	220.4	--	773.1	--
C-Agriculture course	7.6	--	304.6	--
H-4H or FFA member	.9*	--	486.8	--
W-White	418.7	--	1676.1	--
EI	10.7	16.0	22.6	98.9
EP	16.0	17.6	139.0	254.0
EC	.7*	.9*	6.5	39.8
EH	8.6	2.0	20.3	109.9
EW	11.9	14.6	1.1*	2.4*
IP	27.2	40.5	76.1	186.2
IC	4.0*	12.8	4.3	86.4
IH	.3*	10.8	8.4	90.3
IW	.2*	.1*	.8*	.0*
PC	.6*	20.2	6.3	144.2
PH	16.0	.1*	24.8	140.3
PW	.0*	.1*	7.3	6.7
CH	300.0	343.8	854.9	218.5
CW	21.9	41.3	9.3	1.2*
HW	.3*	12.7	14.9	.2*
PCH	6.6	8.9	5.4	12.2
IPH	.0*	1.5*	11.7	12.2
EPH	.2*	1.3*	3.2*	7.5
CHW	2.9*	2.4*	3.0*	4.9

*$p \geq .05$

Table 4. Summary of models fitted to agriculture student data: Total and incremental effects of reduced models

Model	Degrees of freedom	Goodness-of-fit G^2	
		Total effect of model	Difference from final model
1890 Final Model			
EP, EI, EW, EH, IP, IC, CW, PCH	46	32.8	--
EP deleted	47	49.6	16.9*
EI	47	44.3	11.5*
EW	47	46.0	13.2*
EH	47	42.9	9.2*
IP	47	61.3*	28.5*
IC	47	41.6	8.8*
CW	47	72.7*	39.9*
PCH	47	41.8	9.0*
1862 Final Model			
EI, EC, PW, EPH, PCH, CHW, IPH	43	52.5	--
EI deleted	42	72.4*	19.9*
EC	42	57.3	4.8*
PW	42	60.6*	8.1*
EPH	42	57.7	5.2*
PCH	42	62.8*	10.4*
CHW	42	56.5	4.0*
IPH	42	61.6*	9.1*

* $p < .05$

Table 5. Standardized residuals[a] for log-linear models of expectation to farm fitted to agriculture student data: 1890 and 1862 samples

4-H or FFA Member (H)	Took agriculture course (C)	Father a farmer (P)	Inherit a farm (I)	Expect to Farm (E)							
				No				Yes			
				White		(W) Nonwhite		White		(W) Nonwhite	
				1890	1862	1890	1862	1890	1862	1890	1862
No	No	No	No	1.3	+	-	-1.2	1.1	-	-1.8	1.9
			Yes	+	-	-	+	-	-	-	+
		Yes	No	-	-1.0	+	+	-	-1.2	+	3.0
			Yes	-	-	-	1.2	+	+	1.0	+
	Yes	No	No	-	-1.5	-	-1.1	1.2	1.5	+	+
			Yes	-	1.3	+	1.3	+	+	-	+
		Yes	No	+	+	-	-	-	+	+	+
			Yes	-	+		+	+	-	-	-
Yes	No	No	No	-1.3	+	+	-	-	-	+	+
			Yes	-	-	+	+	-	+	+	-
		Yes	No	-1.1	2.2	-	+	1.2	+	+	+
			Yes	-	-	+	-	-	-	+	-
	Yes	No	No	-	-	-	1.2	+	-	+	1.5
			Yes	+	+	+	-	+	+	+	+
		Yes	No	+	-	-	+	-1.3	-	1.3	+
			Yes	-	+	+	-	-1.3	+	1.4	-1.4
Number of (over-under) estimates				-3	0	-1	1	0	0	4	4

[a] Values are shown for residuals greater than $\pm$ 1.

Table 6. Log-linear parameters for models of expectation to farm fitted to agriculture student data: 1890 and 1862 samples

Factor	Log-linear parameters (lambda) 1890 Sample	1862 Sample
Theta (Mean)	1.35	1.56
E-Expect to farm	-.88**	-.61**
I-Inherit a farm	.19*	.52**
P-Father a farmer	-.33*	-.35**
C-Agriculture course	-.03	-.20*
H-4H or FFA member	-.07	.06
W-White	-.69**	1.19**
EI	.21*	.17
EP	.26*	.47**
EH	-.19*	.19*
EW	.25**	--
EC	--	-.10
IP	.23*	.38**
IH	--	.08
IC	.11	--
PC	.05	.21*
PH	.24**	.23*
PW	--	-.18
CH	.65**	.79**
CW	-.32**	-.17
HW	--	.26*
PCH	-.16*	-.15
EPH	--	-.09
IPH	--	-.13
CHW	--	.15

* Lambda is twice its standard error
** Lambda is three times its standard error

Table 7. Marginal tables for selected three-way interactions in agriculture student data

1890 Sample	I. Table	PCH	
Father a Farmer (P)	Agriculture Course (C)	4-H or FFA Member (H)	
		Yes	No
Yes	Yes	110	20
	No	21	35
No	Yes	241	62
	No	35	263

1862 Sample	II. Table	PCH	
Father a Farmer (P)	Agriculture Course (C)	4-H or FFA Member (H)	
		Yes	No
Yes	Yes	174	14
	No	48	87
No	Yes	292	47
	No	91	1035

1862 Sample	III. Table	EPH	
Father a Farmer (P)	Expect to Farm	4-H or FFA Member (H)	
		Yes	No
Yes	Yes	114	48
	No	108	53
No	Yes	63	77
	No	320	1005